Annals of Physical Medicine

The official organ of the
BRITISH ASSOCIATION OF PHYSICAL MEDICINE

July 1953

THE TENTH ANNUAL MEETING

The Tenth Annual Meeting of the British Association of Physical Medicine was held on April 17 and 18, 1953, in the Medical School of University College Hospital, London.

Opening Discussion

The whole of the first morning was devoted to a discussion on "Training for Physical Medicine", 57 members being present. Lord Horder took the chair. The openers were Dr. P. Bauwens, Dr. C. J. S. O'Malley, and Dr. A. C. Boyle (on behalf of Dr. F. D. Howitt, who was indisposed); their papers are published in full elsewhere in this issue (p. 253). Much of the discussion centred round attempts to define the meaning and scope of physical medicine. Despite the apparent difference in the views held by many of the members present, a considerable amount of agreement was reached by the time the openers wound up the discussion. The trilogy, (1) the diagnosis and treatment of the medical disorders of the locomotor system, (2) the treatment of these and other disorders by means of physiotherapy, and (3) rehabilitation, was accepted as the most workable definition. It was also agreed that neither the M.R.C.P. alone nor the Diploma in Physical Medicine alone was adequate for consultant status. Both were desirable, but the possession of one alone or even of both together was not enough without long and wide experience in physical medicine itself.

The warning given by Dr. O'Malley—that if a full, comprehensive rehabilitation service is not supplied soon under the direction of physical medicine specialists, others less well trained will step in to fill the gap—should not be allowed to pass without special comment. If the discipline of physical medicine is, as we claim, that of treating the whole patient, then the challenge to provide a complete service must be met, even though it may mean the adoption of a less academic and more practical approach.

The Tenth Annual Meeting

After a most enjoyable lunch in the Medical School Refectory, the afternoon was spent at a clinical meeting. This was organized in a thoroughly efficient and original way by Dr. Hugh Burt's team—Drs. Fletcher, Kininmonth, and Mattingly. This meeting will be reported more fully later.

Annual Dinner

The Annual Dinner of the British Association of Physical Medicine was held in the Library of the Royal College of Surgeons on Friday, April 17, 80 members and guests being present. Lord Horder presided. The following were guests of honour: The President of the Royal College of Surgeons, Sir Cecil Wakeley, and Lady Wakeley; the Chief Medical Officer of the Ministry of Health, Sir John Charles, and Lady Charles; the President of the Royal College of Obstetricians and Gynaecologists, Mr. A. A. Gemmell; the President of the Royal Society of Medicine, Dr. F. M. R. Walshe; and the Director-General, Royal Air Force Medical Services, Air Marshal J. M. Kilpatrick.

The loyal toast was proposed by the President. This was followed by a toast to "The Association", moved by Sir John Charles, which was replied to by the President. The toast to the guests, proposed by Dr. W. S. Tegner, was replied to by Dr. F. M. R. Walshe.

On behalf of the International Congress of Physical Medicine (1952) Lord Horder presented to Sir Cecil Wakeley, as President of the Royal College of Surgeons, a silver cup (see frontispiece) as an expression of the appreciation of the Congress for the hospitality extended to it by the Royal College of Surgeons. The cup is inscribed: "Presented to the Royal College of Surgeons in appreciation of the generous hospitality extended to the International Congress of Physical Medicine, London, 1952", together with the date of presentation. This piece of silver, which was designed by Mr. Robert E. Stone, was awarded First Prize in the Annual Goldsmiths and Silversmiths Art Council Demonstrations, 1952–3, and bears the Goldsmiths' Hall Coronation mark, commemorating the Coronation year of Queen Elizabeth II. In accepting the presentation, Sir Cecil Wakeley thanked Lord Horder on behalf of the Royal College of Surgeons and welcomed the Association to the College. He continued, during which time the cup was being passed round for inspection, to give an interesting talk on the pieces of College silver which were used to decorate the tables. After the dinner Sir Cecil very kindly showed members and their guests round the College picture gallery.

Films

On Saturday morning the business meeting of the Association was held (an account will be found on page 273). This was followed by the showing of three films.

1. "Radiography of the Vertebrae" (John Wyeth and Brother, Ltd.), introduced by Dr. A. C. BOYLE.

   In this film the uses of tomography in skeletal radiology and the importance of correct angles are beautifully and clearly demonstrated.

2. "Rheumatism and Rehabilitation", by Dr. FRANCIS BACH.

   This film is a most creditable achievement, having been made in circum-

stances of great difficulty and without financial aid. It is intended more for a lay audience than a medical one. It sets out to show the importance of the team and how each member of it has his contribution to make in rehabilitating the cripple. Dr. Bach need not have apologized for what he called his amateur efforts; the acclamation of the audience must have reassured him on this point.

3. "There is a Way" (Crown Film Unit). Sponsored by the Ministry of Health and introduced by Dr. F. S. COOKSEY, who helped in its direction.

This depicts the story of the development of a rehabilitation department in an imaginary industrial town. The hero, the young physical medicine specialist, sets out to improve the service. Against opposition both financial and reactionary he gradually wins the day. With the help of a well-disposed Scottish orthopaedic surgeon who is also a good committee man the hero opens his new department on time.

The film contains some excellent shots of rehabilitation class work and is one which should be shown widely to personnel of the Health Services, both medical and lay. It illustrates what can be done and emphasizes that a rehabilitation department need not be a costly affair. Such a film will satisfy a need long felt by many of its viewers: instead of spending hours wrangling in committee it will now be possible to invite one's colleagues to see a film which does the arguing. This film (size 16 mm.) may be obtained from the Central Film Library, Government Buildings, Broomyard Avenue, London, W.3, and costs £1 for 24 hours. About two weeks' notice is needed to secure a booking.

Following the films Dr. J. B. Stewart of Swindon demonstrated the Horder hydraulically operated, self-propelling chair (described in *Annals of Physical Medicine*, 1953, **1**, 184).

Short Papers

Saturday afternoon's programme consisted of four short papers: (1) "Investigation into Chronic Low Back Pain in Young Male Adults", by Dr. J. G. Parish; (2) "Effects of Metal on Short-wave Field Distribution", by Dr. B. O. Scott; (3) "Shoulder–Hand Syndrome", by Dr. D. L. Woolf; and (4) "A Physiological and Clinical Comparison of Rubefacient Ointments", by Dr. H. F. Symons.

At the close of the meeting Lord Horder gave expression to the thanks of the Association to the authorities of University College Hospital for allowing them the use of the medical school, coupling with this the name of Dr. Hugh Burt, who had organized what proved to be a most successful meeting expressing the confident mood of the Association.

D. C. ARNOTT

THE EFFECTS OF METAL ON SHORT-WAVE FIELD DISTRIBUTION*

By BRYAN O. SCOTT
From the Department of Physical Medicine, Radcliffe Infirmary, Oxford

THE effects on field distribution of metal objects situated between the electrodes have for many years been a matter of concern to those applying short-wave diathermy. These workers have always been aware of the risks of this form of treatment when metal is present in the tissues. The physician who turns to the literature for guidance will find a bewildering mass of conflicting evidence. According to many reports the danger of burning is great. Schliephake (1935), among others, advises the removal of all metallic objects, since they may become unpleasantly heated. This warning was repeated by Bierman (1942), who considered that metallic objects may concentrate the field. Kowarschik (1935) observed heating of metal wires in a short-wave field and also the presence of arcing. He noted, however, that metallic dental fittings in a short-wave field did not appear to cause any difficulties, though he could offer no explanation for this.

On the other hand, Etter, Pudenz, and Gersh (1947) claimed that burning occurred only when the energy exceeded the therapeutic range; they considered the most conclusive finding to be the absence of destructive changes when nerves were wrapped in tantalum foil, even though the overlying skin and muscle showed third-degree burns. More recently Smith (1950) stated that no heating takes place either in or around the metal.

It is interesting to note that those who maintain that the danger of burning is small, usually consider that diathermy is contraindicated when the metal is in contact with or close to the skin. As the field strength is known to be greater close to the electrodes than in the centre (Scott, 1953), this is tantamount to recommending the use of a weak field when treating patients who have a metallic implant. Athermic diathermy (that is, with low field strength) is, however, known to be of no clinical value.

The heating that occurs within any material in a short-wave field is related to (1) the field strength, (2) the power factor, and (3) the dielectric constant (Scott, 1952). The first two of these are the most important, since the differences between the power factors of various materials are great compared with the differences in their dielectric constants (Hartshorn, 1946). Considering these three factors in relation to metal, which has a low power factor, it is most unlikely that metal will become heated in a short-wave field.

* Paper read at the Annual Meeting of the British Association of Physical Medicine on April 18, 1953.

Metal in the Short-wave Field

Experiments on the Effect of Metal in a Short-wave Field

To clarify this controversial subject, the following experiments were performed. Investigations were made by applying high-frequency fields to phantom loads consisting of containers filled with 2% agar mixed with a heat indicator; their preparation has been described elsewhere (Scott, 1952).

Lack of Heating

A phantom containing a circular metal disk was placed in a short-wave field. After eight minutes, when a considerable degree of heating had occurred in the indicating medium, the metal was moved across the phantom and a pointer equal in length to the diameter of the metal substituted (Fig. 1). No heating occurred beneath the metal, which itself remained cold, whereas the medium was very hot. Fig. 2 shows an undistorted heating pattern after ten minutes in a phantom covered with lead shot. Once again there was no evidence of heating in the metal.

Concentration of Current at Metallic Points

It has been stated that a high-frequency current concentrates at pointed parts of a metal object. This is illustrated in Fig. 3; heating has taken place in the medium about the two points nearest the electrodes. However, points in themselves are not the complete cause of the field concentration; for instance, no heating occurred at the only point on the metal object shown in Fig. 4.

Screening Effect

Metal is used as a screen for high-frequency currents in most physical medicine departments, but it is not usually realized that metal can act as a screen in a treatment field. In the experiment shown in Fig. 5, heating occurred at the points in an unscreened field at one minute. When the field was screened there was no heating at the points after six minutes (Fig. 6).

This experiment explains the finding of Etter *et al.* (1947) that nerves wrapped in tantalum foil are not damaged. In the experiments of these authors the diathermy was applied in such a way that the nerve was effectively screened.

Field Concentration and Spreading Effect

Field concentration has been thought by some workers to be caused solely by the presence of metal in the tissues. Metal implants placed as shown in Figs. 7 and 8, whether they are larger or smaller than the electrodes, have no effect on the normal heating pattern. If, however, two pieces of metal larger than the electrodes are placed in the field as shown in Fig. 9, the effect is to spread and weaken the field and not to concentrate it.

Shunting Effect

Localized heating of the medium due to field concentration occurs when a metal object is so placed that it forms a shunt or pathway of low resistance. When placed as shown in Figs. 7 to 9 the metal object does not provide a shunt allowing an easier pathway for the energy. If the metal is turned so that it provides a large shunt, intense heating occurs in the medium about the ends of the shunt. A temperature rise of approximately 20° C. per second has been produced by using a shunt–electrode distance of 4 : 5 (Fig. 10), which is arrived at by dividing the length of the shunt by the distance between the electrodes. A Smith-Petersen tri-fin nail 7·2 cm. long concentrated the field and caused the medium at the end of the nail to boil in only 16·2 seconds. The shunt electrode distance was 1 : 4·15. Surely this rise in temperature would be too large for even the most profuse blood supply to dissipate.

A simple method of demonstrating rapid local heating due to the shunting effect is to hold a piece of wire about 3 inches in length longitudinally in a short-wave field. The rate of change of temperature will become readily apparent; should the shunt be long enough, there would be danger of burning of tissues.

Effect of Multiple Shunts

When the field is provided with more than one shunt, the concentration of the heat takes place about the ends of the longest one. No great concentration occurs at the ends of the shorter shunts. This is demonstrated in Fig. 11, which shows the effect after 25 seconds' heating. Fig. 12 shows that when the longest shunt is removed the next longest causes field concentration. No heating occurs at the smaller shunt. The effects of boiling of the medium under the longest shunt seen in Fig. 11 are also visible in Fig. 12.

Fig. 13 is included to show that the current uses only the shunts or parts of a shunt which provide the simplest pathway.

It may be argued that the heating which occurs at the ends of a conductor is brought about by field concentration at a point and that the metal does not shunt the current. Fig. 14 shows that two pieces of metal each provided with a point favour field concentration and form an easy pathway for the current. These metal objects are connected by a copper-wire shunt. There is no evidence of heating at the points after six minutes, although a good heating pattern is obtained between the electrodes and the metal. When the shunt is disconnected, heating appears at the points in three minutes, as the current has now been forced to cross the medium (Fig. 15).

A simpler experiment illustrating this shunting effect is to hold the hand flat in a short-wave field with the fingers at right angles to the field. Insert a piece of iron bar about 7 inches long into the field, parallel to the

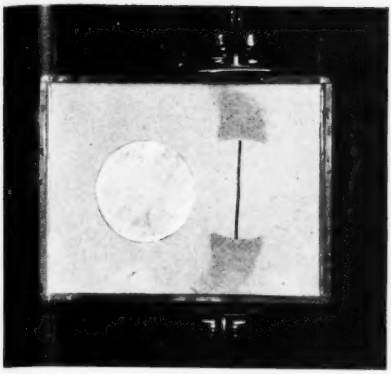


FIG. 1

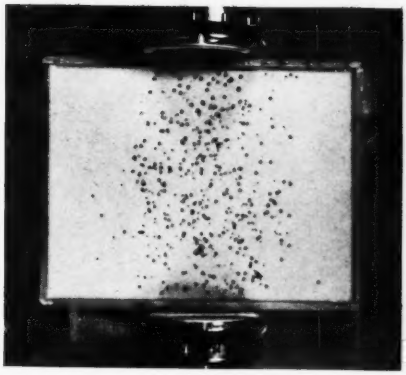


FIG. 2

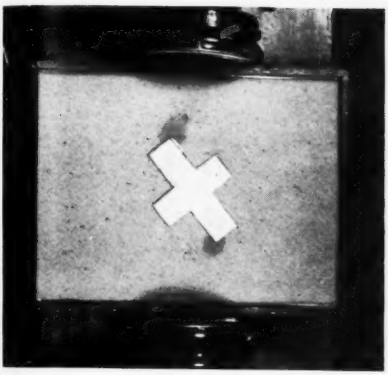


FIG. 3

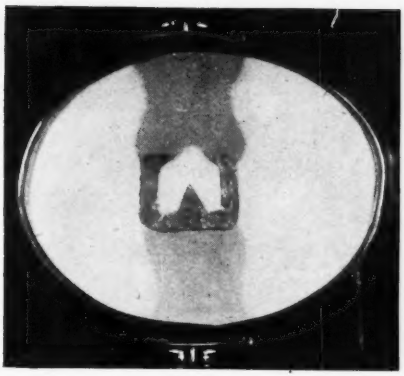


FIG. 4

FIG. 5

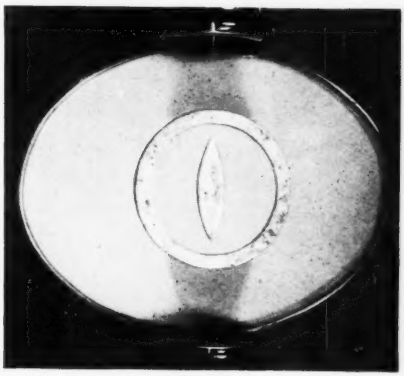


FIG. 6

[B.O.S. face p. 240]

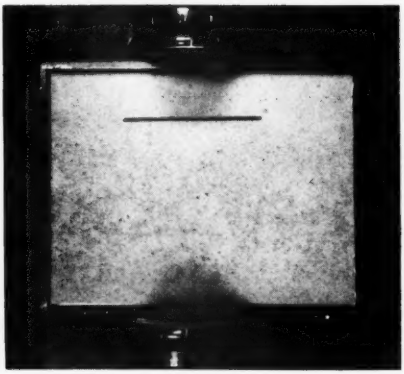


FIG. 7

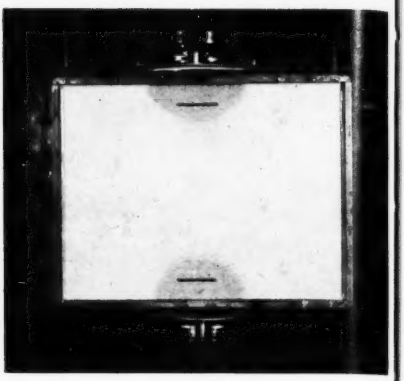


FIG. 8

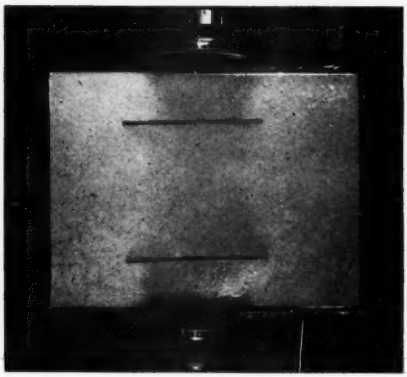


FIG. 9

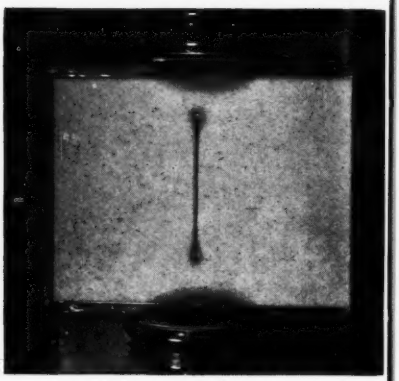


FIG. 10

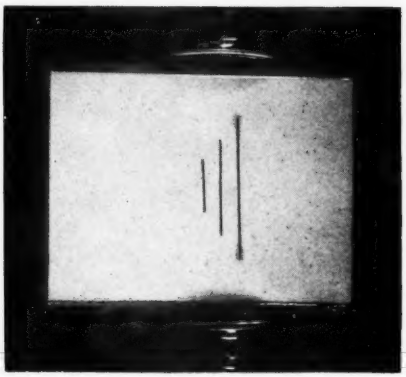


FIG. 11

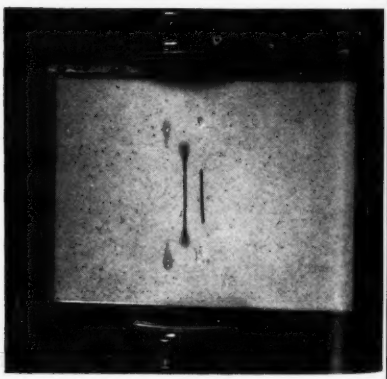


FIG. 12

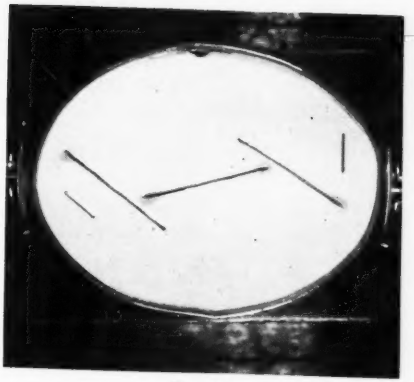


FIG. 13

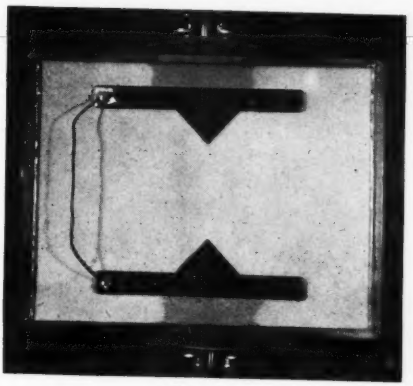


FIG. 14

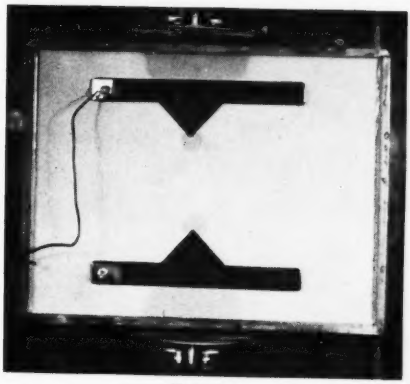


FIG. 15

fingers. Heating will be felt at the borders of the hand in the usual way. When the bar is turned parallel to the field the heating in the hand is immediately diminished. The heating appears as though turned on and off by a tap. It should be noted that some retuning of the apparatus may be necessary.

Comment

It appears from the above experiments that metal will not get hot in a short-wave field. If, however, the metallic body acts as a shunt, thereby concentrating the field strength, sufficient heat develops in the tissues (but not in the metal) to cause burning. If there is no shunt there is no concentration; if there is a long shunt there is high concentration. This is exactly what the application of basic physical principles would lead one to expect if the metal is shunting the reactance of the load. On this basis the equivocal results published previously can be easily explained.

Practical Application

To eliminate this shunting effect where the patient has metallic implants, the following simple procedure is recommended. Radiographs should be taken in both the antero-posterior and lateral views. This will show the exact orientation of the conductor. The electrodes should then be arranged with the shortest shunt of the metal parallel to the field. In this way the shunt is either eliminated or minimized. Although this is usually easy, there are cases in which elimination of the shunt is impossible.

It is obviously desirable to know the length of shunt that may be present without danger. This critical length depends upon the distance between the electrodes, their size, and the effective length of the shunt. Consideration of Fig. 16 will show that current passing between the

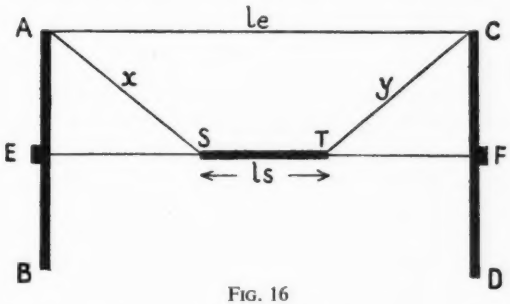


FIG. 16

electrodes AB and CD has a choice of three main pathways—AC, ESTF, or ASTC. Current passing between E and F will always take the direct pathway through the shunt; that from A to C will take the pathway of least resistance. This will be ASTC, provided that $x+y$ is less than le.

When $x+y$ is greater than *le*, most of the current from A will flow direct from A to C. The current will therefore cease to concentrate at S and T, and there will be no danger of burning. This is demonstrated graphically in Fig. 17. Values obtained experimentally were used to plot the graph of

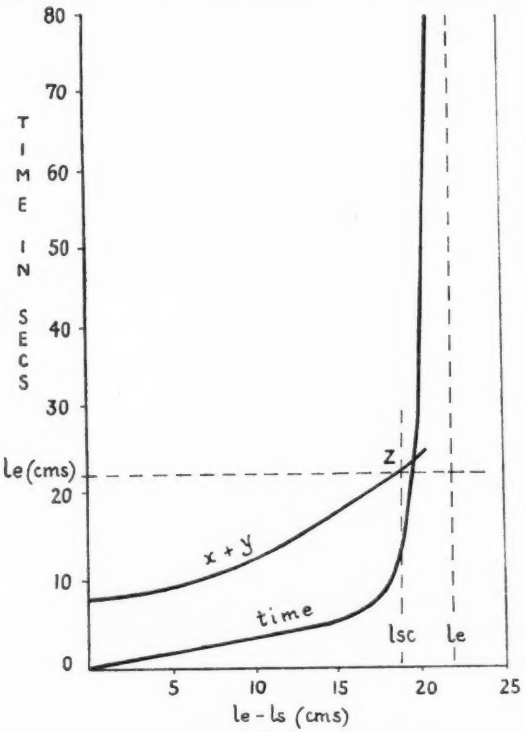


FIG. 17

t against *le*—*ls*, where *t* is the time taken to reach a constant temperature, *le* the distance between the electrodes, and *ls* the length of the shunt. In this experiment $x+y$ was calculated for the various values of *ls* used, and was then plotted against *le*—*ls*. If the length *le* is plotted on the same scale as $x+y$, $x+y$ cuts the value of *le* at the point Z. Therefore *ls* critical (*lsc*) is obtained by dropping a perpendicular from Z to the abscissa. It will be seen that *ls* critical cuts the experimental graph just beyond the point where the graph begins to tend rapidly toward infinity, and this indicates that at this critical value of *ls* the current no longer concentrates on the shunt.

From these results and from observations of experimental heating patterns I have deduced a logical procedure for obtaining the critical value of $x+y$ for clinical use. A scale drawing of the effective length of

shunt in relation to the electrodes is made from the X-ray plates. The following geometrical construction is then carried out (see Fig. 18).

Perpendiculars are drawn at the ends of the shunt.

Two lines at 45 degrees are drawn from the ends of the shunt to cut the vertical line representing the electrode nearest to it at A. (Experimentally it is

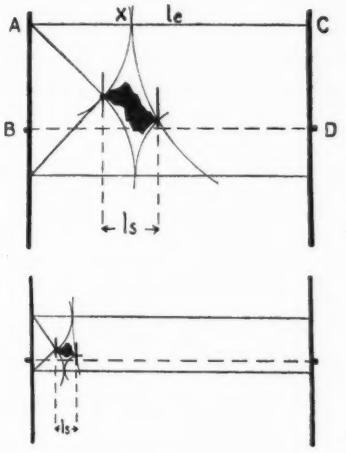


FIG. 18

found that the field does not concentrate to any marked extent on the shunt when the resultants of the lines of force subtend an angle of about 45 degrees to a line perpendicular to the shunt at the point of entry.)

Draw AC parallel to the axial line of the field to cut the opposite electrode at C.

With centre A or the end of the electrode, whichever is the nearer to the end of the shunt, and with radius AS, draw an arc to cut AC at X.

With centre C and radius CX, draw another arc. Repeat the whole construction on the opposite side of the shunt.

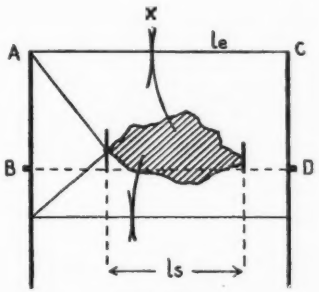


FIG. 19

Provided that the shunt is not cut by either of these latter arcs, there will be no concentration of the field at the ends of the shunt, and therefore no danger of burning the tissues (Fig. 18). If, however, the shunt is cut by the arcs (Fig. 19) burning will take place. Burning is likely only when the product of the field strength and the length of the shunt is large. Since the field strength is greatest near to the electrodes, obviously the effect of any shunt is greater in the superficial than in the deep tissues. It should be noted that compensation for the variations in the value of the field strength is provided by the procedure described (i.e. a longer shunt is permitted midway between the electrodes than close to them). In the tissues the blood supply provides an added safety factor for the dissipation of heat.

Since the dangers of shunting the field are now known, and can be overcome, it should be possible to treat the majority of patients who have previously been refused short-wave diathermy, and also to treat more safely the increasing number of patients with metallic implants.

Summary

1. Experiments carried out on phantoms showed that metallic bodies do not get hot in a short-wave field.

2. Only when the metallic body acts as a shunt, thus concentrating the field strength, does sufficient heat develop in the tissues (not in the metal) to cause burning. Otherwise the presence of a metallic body is not a contraindication to short-wave therapy.

3. A method has been devised of calculating when the shunting effect will appear in a given case.

4. It is usually possible to minimize the shunting effect by arranging the electrodes with the shortest shunt of the metal parallel to the field.

Acknowledgments

I wish to thank Messrs. Allen and Hanburys Ltd., London, for the loan of the Smith-Petersen tri-fin nail used in some of the experiments. I am also indebted to Miss M. A. McLarty, the artist at the Radcliffe Infirmary, for her willing co-operation in drawing the diagrams.

REFERENCES

BIERMAN, W. (1942) *Medical Applications of Short Wave Therapy*, p. 134. Waverley Press Inc., Baltimore.

EDITORIAL (1947) *Arch. phys. Med.*, **28**, 336.

ETTER, H. S., PUDENZ, R. H., and GERSH, I. (1947) Ibid., **28**, 333.

HARTSHORN, L. (1946) *Nature, Lond.*, **157**, 51.

KOWARSCHIK, J. (1942) Cited by Bierman, W.

SCHLIEPHAKE, E. (1935) *Short Wave Therapy*, p. 127. Actinic Press Ltd., London.

SCOTT, B. O. (1952) *Ann. phys. Med.*, **1**, 103.

——— (1953) *Proc. R. Soc. Med.*, **36**, 331.

SMITH, G. (1950) *Brit. med. J.*, **1**, 1466.

THE SWINDON SPASTIC UNIT

By J. B. STEWART* and J. URQHART†

ONE of the chief problems facing those interested in the welfare of the spastic child is the shortage of special schools. Bosworth Smith (1953) has given a comprehensive survey of the present position in England and Wales as it is known to the British Council for the Welfare of Spastics. From the available evidence he estimates that there are 6,000 spastics of school age. Including special units in the schools for the physically handicapped, there are six day and twelve residential schools for spastic children. The total number attending these schools and units is about 330. Many others receive home teaching or attend ordinary schools. Thus there is a serious shortage of places in special units where these children can have the benefit of the excellent training facilities which are available. Private philanthropy cannot be expected to provide all the necessary aid; nor is it likely that the National Health Service will be able to devote large sums of money to this purpose. We as a profession must, therefore, make an effort to seek other means whereby the basic methods of training which have proved so helpful in the management of spastic children may be put into practice.

Origin of the Scheme

In 1951, eighteen children in the Swindon district were known to be suffering from cerebral palsy. Of these, five were considered too young or too severely handicapped to benefit from special training. Of the remaining thirteen, six were put forward by the local authority for places in one or other of the special schools for spastic children, but only one was admitted. The usual reason given by the interviewing panel for rejecting applicants for entry was lack of ability as predicted by the intelligence tests now in common use, most of the special schools requiring for admission an intelligence quotient above 80.

In February, 1951, a discussion on the question of spastic children in Swindon and the surrounding district took place between the authors who were deeply interested in and anxious to deal with the problem. A tentative plan was made. As a result, all children shown in the School Medical Officer's Annual Report as suffering from cerebral palsy, and who had already been classified by degree of both physical and mental handicap, were brought to the Department of Physical Medicine and re-examined. Further new cases were referred by the paediatric and orthopaedic consultants. In all, thirty-one cases were sent between February, 1951, and July, 1952.

* Consultant in Physical Medicine for Cirencester, Pewsey, and Swindon Hospital Management Committees.
† Medical Officer of Health and School Medical Officer, Swindon.

Operation of the Scheme

Regular training of these children was the objective, and in order to decide the type of child who would benefit from it, the child and both the parents were invited to attend the Department of Physical Medicine for one morning a week. Particular attention was paid to the attitude of the parents during the initial phase.

At the first of these regular visits, one of us (J. B. S.) explained in detail to the parents what it was hoped to do for the children and what co-operation would be required from the parents. In addition, so that parents might keep themselves fully informed as to what was being done in other areas and by the various official bodies interested in their problem, a Parents' Association was formed. All members receive the *Spastic Quarterly* published by the British Council for the Welfare of Spastics.

After a short time it became evident that the parents were embarrassingly enthusiastic. When one listened to stories of the fruitless search for help for their children, one appreciated the eagerness with which they devoted themselves to this new effort. Most encouraging, too, was the response from the children, who, in spite of their handicap, did all they could to co-operate with the physiotherapists and showed their appreciation in their own way. Frequently one felt, even in the most severe cases, where previously there would have been little or no hesitation in dubbing the child "idiot", that there was behind the inane grin an intelligence struggling for release and expression.

The Present Unit

It was at this stage that we decided to put in a plea for enlarging the scope of the work, so that educational as well as physical training would be available. The numbers of children of school age attending did not warrant our requesting the formation of a special school with all the expense involved, but it was felt that, if a schoolroom and teacher were available in the Department of Physical Medicine, training of the children could be considerably extended. Apart, too, from the question of expense, it was thought that an establishment of a "day-school" type would be beneficial, in that it would allow the children to continue to enjoy home life and parental care.

Proposals to this effect were laid before the Swindon and District Hospital Management Committee and the Local Education Authority, where they met with approval. Both bodies readily made available sums of money for setting up the unit. The Hospital Management Committee provided additional accommodation in the Physical Medicine Department, where physical treatment was already being given; they also made available the services of a skilled joiner and allocated a sum of money for specially designed furniture, etc. The Local Education Authority appointed a teacher and provided funds for the educational functions of the unit.

Of the children being treated in the Physical Medicine Department, ten were, in the first instance, considered suitable to attend the unit. Of the remainder, many were only slightly handicapped and were receiving education at ordinary schools; others were considered too young to benefit from training in the unit itself, but continue with their weekly visits, accompanied by the parent, to the Physical Medicine Department. Each of the ten pupils had suitable school furniture designed by one of us (J. B. S.) and made by the joiner.

From the outset great stress has been laid on the simultaneous training of the parents, so that they are fully aware of all that is being done for their children and are able to continue with training of the child at home. Parents are responsible, on a rota basis, for escort duties to and from the department, the hospital transport being utilized where necessary. Parents also assist in dressing and undressing the children and in their movements about the department, to lavatories, etc., and help in numerous other ways, thus making unnecessary the employment of ancillary personnel.

Although a teacher had been appointed and seconded on October 1, it was not possible for the unit to come into full operation immediately, because, owing to unforeseen circumstances, there was a delay in making the schoolroom available. This unavoidable interval was in many ways fortunate, as it gave the teacher time to become familiar with the methods used in special establishments and, more particularly, to attend the Department of Physical Medicine, where she saw her future pupils being treated by the physiotherapists. She was thus able to gain an insight into their special individual requirements, both physical and educational.

The unit has the services of three full-time and two part-time physiotherapists, one of the part-time workers having had experience in the treatment of cerebral palsy. The Hospital Management Committee have also recently appointed an occupational therapist, who, as in the case of the teacher, is making herself familiar with the children before giving occupational therapy on a more formal basis.

Speech therapy has been arranged in co-operation with the Education Authority, a speech therapist attending the department for one session weekly. It is hoped that longer periods of speech training may be possible in the near future.

Trial Period

In order to assist the reactions of the children to an entirely new type of daily life and to perfect the organization in the light of experience, it was decided to start operations by stages.

In the *first stage*, which lasted only a few weeks, the children attended the unit on three mornings a week from 9 a.m. to 12 noon, with a short mid-morning break for biscuits and milk.

In the *second stage*, which lasted the whole of the spring term, daily attendance was arranged from 9 a.m. to 12 noon.

In the *third stage*, which has been in operation since the beginning of the summer term, those children who are fit enough attend for a full school day. This involves the more difficult organization of a midday meal.

School Meals Organization

Following a series of meetings between representatives of the Local Education Authority and the Hospital Management Committee, an agreed plan for feeding the children was formulated. The Hospital Management Committee provided all the necessary utensils for serving meals and keeping them warm, together with all table appointments. The normal school meals service delivers the necessary food in containers, and collects these afterwards. Payment is made by the Hospital Management Committee for meals served.

Under the general supervision of the Superintendent Physiotherapist, the meals are served by the parents on duty, assisted by voluntary helpers provided by the Women's Voluntary Services. This arrangement ensures that serving and washing-up are rapidly and efficiently carried out.

After lunch the children have a complete rest on cot mattresses kept for the purpose in the department.

To begin with, certain difficulties were brought to light with this arrangement. Some parents were over-eager in their efforts to encourage their own or the children of others to eat strange food in strange surroundings. Some were strict disciplinarians with the fixed idea that all meals must be eaten to the last spoonful, regardless of the child's preferences or appetite. There has, however, been a marked improvement in this respect, and the midday meal is now a happy period in school life.

The unit was officially opened by Lord Horder on October 15, 1952.

Summary

1. A non-residential unit for spastic children has been set up in the Department of Physical Medicine and Rehabilitation at Swindon. The unit is jointly run by the Local Education Authority and the Hospital Management Committee, whose various responsibilities are outlined.

2. Training, both physical and educational, is provided for those children capable of benefiting from it who could not be admitted to a special school.

3. Accommodation consists of a room, measuring 18 by 17 feet, suitable for ten children, and provided with specially designed furniture made in the department.

4. The staff consists of a teacher appointed by the Local Education Authority, together with two part-time and three full-time physiotherapists and an occupational therapist, who assist in the work of the unit in addition to their normal duties in the general department. The services of a

speech therapist have also been made available by the Local Authority for one session weekly.

5. The normal School Meals Service provides food for the midday meal, which is served by a rota of parents and W.V.S. helpers under the supervision of the Superintendent Physiotherapist.

6. Parents are responsible for a duty rota providing escorts to and from the department, hospital transport being utilized where necessary. They also assist in numerous other ways, such as dressing and undressing the children. In addition, they receive from the physiotherapists and teacher instruction and guidance in the care of their children. It would, indeed, be impossible for the unit to run efficiently without their willing help and co-operation.

Acknowledgment

We wish to thank Lord Horder for his encouragement and help.

REFERENCE

BOSWORTH SMITH, N. D. (1953) *Education*, **101**, 128.

AN INVESTIGATION OF THE EFFECT OF PHENYLBUTAZONE ON THE SKIN RESPONSE TO ULTRAVIOLET LIGHT

By M. W. PARTINGTON

From the Department of Physical Medicine, London Hospital

CORTISONE has been shown to reduce the inflammatory response of the skin to ultraviolet-light irradiation (Jarvinen, 1951). In view of the effect of cortisone and of phenylbutazone ("butazolidin") on rheumatoid arthritis it seemed of interest to discover whether the latter substance also had an action on the skin response to ultraviolet light.

Method

The subjects investigated, numbering 35, were out-patients with rheumatoid arthritis taking part in a clinical trial, conducted by Drs. Freeland, Storey, and Thompson (1953), of the therapeutic effects of phenylbutazone. The disease was considered to be active in all patients. The proportion of women to men was 5 : 1 and their ages ranged from 23 to 70 years. Of the 35 patients, 16 were treated with phenylbutazone, 0·2 g. three times a day by mouth, and 19 with an inert substance in similar tablet form.

The skin response to ultraviolet light was measured by the duration of exposure necessary to produce an erythema just perceptible after 22 hours. The source of radiation was an air-cooled mercury-vapour lamp (Hanovia) at a distance of 18 inches from the skin. Separate areas of skin in the middle of the back were successively exposed, dosages ranging from 5 to 75 seconds, with increments of 5 seconds. On the first occasion the skin on the left of the spine was exposed through 15 holes of 1 sq. cm. cut 1 cm. apart in a piece of cardboard and arranged in 3 rows of 5 holes. This was repeated on the right side of the spine at the same level on the second occasion. The back was inspected for just perceptible redness 22 hours after irradiation and the number of seconds' exposure required for this minimal reaction was noted. The conditions of lighting and room temperature at this time were as constant as practicable for every observation. All the observations were made by one observer, who was unaware of the treatment a particular patient had been given until the whole series of trials was complete. Minimum perceptible erythema (M.P.E.) was estimated in all cases before the start of treatment, and again after 14 days. In 5 of the patients the initial M.P.E. exposure time was greater than 75 seconds; these patients were not retested.

Results

The results, which are shown in the table, are expressed in multiples of 5 seconds required to produce minimal perceptible erythema under the conditions described. The differences between the various columns in the table were submitted to "t" tests; no significant difference was demonstrated. It is clear that the administration of phenylbutazone did not alter the dose of ultraviolet light required to produce minimal perceptible reddening of the skin.

COMPARISON OF M.P.E. IN THE TWO GROUPS MEASURED BEFORE AND FOURTEEN DAYS AFTER THE START OF TREATMENT

(1 unit = 5 seconds' exposure)

Group Receiving Phenylbutazone			Group Receiving Inert Substance		
Patient No.	Before Treatment	After 14 Days	Patient No.	Before Treatment	After 14 Days
	Units	Units		Units	Units
1	1	2	1	3	4
2	5	5	2	7	8
3	7	15	3	5	6
4	7	2	4	7	5
5	7	5	5	5	5
6	6	6	6	8	4
7	4	3	7	8	8
8	4	4	8	4	6
9	6	4	9	15	7
10	7	12	10	4	4
11	7	7	11	5	6
12	2	4	12	5	5
13	8	7	13	3	4
14	7	4	14	8	8
15	3	3	15	8	10
16	6	9	16	10	7
			17	9	5
			18	5	8
			19	5	5
Mean ..	5·4	5·7	Mean ..	6·5	6·0

Conclusion

Jarvinen (1951) regarded the increased resistance of the skin to ultraviolet light in patients taking cortisone as one of this drug's "anti-inflammatory" effects—that is, an effect whereby the tissue response to an inflammatory stimulus is reduced. He further suggested that cortisone was beneficial to patients with rheumatoid arthritis on account of this anti-inflammatory effect. The present observations supply no evidence in respect of the joints, but show that, under the conditions described above,

phenylbutazone does not reduce the inflammatory skin response to ultraviolet light.

Summary

1. An investigation was carried out to determine whether phenylbutazone (butazolidin) had the same effect as cortisone in reducing the inflammatory skin reaction to ultraviolet light.

2. Patients with rheumatoid arthritis given phenylbutazone and patients with rheumatoid arthritis receiving an inert substance were exposed to ultraviolet light.

3. Phenylbutazone did *not* reduce the inflammatory skin response.

Acknowledgment

I wish to thank Dr. W. S. Tegner for permission to investigate his patients, and Drs. D. Freeland, G. O. Storey, and M. Thompson for their co-operation.

REFERENCES

JARVINEN, K. A. (1951) *Brit. med. J.*, **2**, 1377.
FREELAND, D., STOREY, G. O., and THOMPSON, M. (1953) *Lancet*, **1**, 1227.

DISCUSSION ON TRAINING FOR PHYSICAL MEDICINE

AT THE ANNUAL MEETING OF THE BRITISH ASSOCIATION OF PHYSICAL MEDICINE ON APRIL 17, 1953

I—PHILIPPE BAUWENS

WHEN I accepted the invitation to open this discussion I did not anticipate any great difficulty in making out a case for specialized training in accordance with the regulations for the Diploma in Physical Medicine. It was only when I attempted to develop my theme realistically that I found myself involved in various arguments, with the devil's advocate asking pertinent questions and demanding the formulation of definitions. It was clear that training for physical medicine must already be in process of preparation, not so much for physical medicine of to-day as for what it may become in the future.

The Place of Physical Medicine in the General Scheme

One of the first tasks was to decide where physical medicine in its ideal form fitted into the general scheme of medicine. To simplify this task I toured in imagination what I conceived to be an ideal general teaching hospital. There I visited a number of departments, general and specialized, and found that roughly they fell into three groups. The first group was easily distinguishable because the emphasis was on a special organ or system, of which the functions and dysfunctions were closely studied. It was characterized by anatomical considerations and embraced ophthalmology, neurology, cardiology, etc., the specialists in which were supreme in their fields. In another group—again readily recognizable—the emphasis was on some special technique. The identity of the subjects was in this case dependent on technical procedure. Anaesthetics, radiology, and clinical pathology were representative of this group, which would also have included some of the more specialized components of physical medicine had these not been amalgamated. The specialties in these two groups are easily identifiable. If it were possible to watch a specialist at work in one of them, there is every likelihood of recognizing the specialty either from the type of condition encountered or from the way the patient or a specimen taken from him is examined.

There is a third group where, by contrast, recognition is more difficult. The clue is furnished not by a glance at the assortment of conditions dealt with or the method of examination employed, but by the management of the patient after the diagnosis has been established. If in a particular department a majority of patients were treated with pills, purges, or piqûres, it would be fairly safe to assume that it was the general medical department. If, on the other hand, a substantial number were admitted for operation, a

safer assumption would be the general surgical department. There is yet a third possibility. Should some patients be treated with physiotherapy or occupational therapy while others were referred to rehabilitation centres, the department is almost certain to be that of physical medicine.

At first sight, the lumping together of Medicine, Surgery, and Physical Medicine on the argument advanced might be regarded as a piece of casuistry. I must admit that I would agree had I not taken the precaution of basing my argument on my conception of physical medicine in its ideal form. In this way I intended to convey the idea of a branch of medicine which had earned the distinction of being accepted as indispensable.

The Trinity

It is not for me to remind you in detail of the services which physical medicine can render in the field of diagnosis and management of those conditions which are amenable to physical methods. I use the term "physical methods" in the widest sense to include all forms of physiotherapy, occupational therapy, and rehabilitation. Nor need I stress its important function in the achievement and maintenance of positive health and in the disposal for resettlement of the handicapped.

That the receptacle of such a multitude of charges is more than a specialty must be obvious. It forms a large part of the general scheme of medicine. If it has not fallen into place by the side of medicine and surgery it is because of the immaturity both of the subject and of the training for it.

A Glimpse into the Future

Avoiding the search for other causes, let us spend a more profitable and encouraging moment taking a glimpse into the future with Physical Medicine together with General Medicine and Surgery as partners in a trinity. The scheme might well be depicted diagrammatically as a wheel with spokes separating the three sectors representing medicine, surgery, and physical medicine. At the rim are the specialized sections of each branch, while on the spokes lie the borderline subjects, so that rheumatology, for instance, straddles the spoke separating medicine from physical medicine, and orthopaedics is on that separating surgery from physical medicine. The hub itself rightly stands for the general practitioner with his prerogative of initial sorting. And I would emphasize that this sorting will depend on what he considers is likely to be required for the management of the patient if his own diagnosis is confirmed.

Desirable as this scheme might appear for all concerned, it will not materialize overnight or without the expenditure of well-directed thought and energy; and this brings me to my brief, for I regard adequate training and qualifications as the prime requisite to inspire in our colleagues the necessary confidence.

Training for the Diploma

Having vaguely rationalized the position of physical medicine of the future as a co-partner of medicine and surgery on the basis of similarities not immediately apparent, I shall pursue my analogy in the province of training. By reason of the inherent technical aspect of surgery, I find it easier to compare training for physical medicine with that of surgery than with that of medicine.

It could never be seriously argued that, to become a surgeon, training in the craftsmanship and technicalities associated with surgical procedures is not necessary. Nor could it be suggested that an examination which in large measure caters for this contingency is undignified or tainted on that account. Yet this has frequently been done. Without stretching the analogy to breaking-point—for it is accepted that the F.R.C.S. ranks as a higher qualification—I submit that in many respects the Diploma in Physical Medicine must in the same way, and despite its shortcomings, be regarded as the essential qualification in our own field. Not, however, having the status of a higher qualification, it fails to inspire full clinical confidence. Yet at the lowest valuation it constitutes a guarantee that the holder has spent some time in a department of physical medicine, that he has a knowledge of the amenities available and some idea of how these can be obtained. Perusal of the curriculum for Part II of the Diploma in Physical Medicine will give some idea of the scope of the subject which has hitherto eluded definition.

Far from joining the ranks of the denigrators of this Diploma, I would put it next to the basic qualifications in medicine and surgery as a *sine qua non* for the practice of physical medicine. Here, however, I must interject a proviso in respect of consultantships, for which additional attributes are required; and physical medicine should be no exception in this regard. These additional attributes, of which I could make a long list, include such abstract ones as personality; experience and advanced knowledge of subjects not related to physical medicine itself; the possession of critical and integrating faculties; the capacity for sifting what is significant from that which is not; in short, a host of qualities calculated to promote original work and advance the subject by a correct approach. To acquire these without training or guidance requires a long time; to put them over to colleagues by mere professional intercourse takes even longer. Fortunately, it so happens that the Membership of the Royal College of Physicians offers some guarantee that its holder possesses a substantial number of them.

Double Qualification

In the light of present conditions the Membership is almost an essential for a consultantship, and I rejoice in this, for although I have neither of the qualifications under discussion, I am well aware that only by fitting into key posts men and women of requisite academic status can the aspirations of physical medicine in regard to position be realized.

What of the gestation period? It is my contention that every specialist in physical medicine, whatever his qualifications, can in the interim period contribute something by an endeavour to prove in a scientific and unassuming manner that physical medicine is an indispensable service.

One of the stumbling-blocks to double qualification is the time involved, and it may well be that when, thanks to those who have both the Diploma in Physical Medicine and a higher qualification, physical medicine eventually takes its place at the side of medicine and surgery, it will then have both a Faculty and a higher qualification of its own. In this connexion it is fair to say that those who have the Diploma, as well as those with the Membership only, have helped the cause of physical medicine a step forward. The combination of both, however, is not a mere algebraical sum, but amounts to a whole march forward along the road.

Conclusion

I think our Association has every justification for being sanguine over the fate of physical medicine, provided it can sway every one of its members without exception to work towards the same goal instead of to individual political ends.

I am old enough to have seen physical medicine and its forebears pass through various stages. I can recall the transition from frank empiricism

to pseudo-science. There started in 1928 a more constructive era—that of incorporation, when physical medicine was born out of other specialties. I witnessed the phenomenon of expansion during the war and the subsequent post-war stabilization. Now I look forward with confidence to the dawn of yet another era—that of academic achievement and scientific endeavour.

II—F. D. HOWITT

It is essential, surely, before investigating the training necessary for prospective specialists in physical medicine, to decide exactly what is meant by Physical Medicine, and in particular what are its ambitions and the status which its members hope to achieve in the hierarchy of medicine itself. I am, perhaps, the worst person to help open this discussion, because I have already expressed myself as clearly as I could on several recent occasions. I shall, therefore, be brief, because I am much more anxious to hear what the younger members have to say, for not only their own future but the future of the subject will rest in their hands.

Guiding Factors

I think there are two factors which should guide us: (1) our history, our tradition, and our past achievements; and (2) the nature of the work we are called upon to do. From the point of view of our history, we spring from two disciplines. From one of these we derive the service now known as rehabilitation; from the other we inherit the conduct of rheumatism and other medical disorders of the locomotor system. These are our main province, although in addition we take a primary interest in certain aspects of positive health, such as those concerning youth and old age. These are the subjects in which we have led the way and which we can justly claim to be our traditional right. The reason why these fields of medical endeavour fall within our particular ambit derives from the fact that, although the conduct of every case may involve the use of diets, drugs, and other medication, the value of physical methods predominates.

Here is, at once, both our strength and our weakness. In advising upon and directing the best form of physical treatment, its indications and contraindications, we have sponsored the view that we are purely a therapeutic and not a clinical specialty; that our departments are reference departments and not primary ones. I know that amongst our team we have men of international reputation—and I am thinking at the moment particularly of Dr. Bauwens—who have made immense contributions to the technical side, and their work will continue to enhance the subject. But, in my submission, physical medicine can maintain the position it has achieved, and still further improve it, only by competing with other clinical specialties on equal terms.

F. D. Howitt

The First Essential

The first essential to be grasped and never to be lost sight of is that physical medicine is part of general medicine. No specialist, be he neurologist, dermatologist, or what you will, would, except in the most unusual circumstances, be elected to the staff of a teaching hospital unless he produced evidence that his primary training, qualifications, and interests lay in general medicine. Equally the physical medicine specialist must give proof of such knowledge before adducing evidence of his special knowledge, training, and experience in the technicalities of the subject. But to place technical knowledge before general medicine would be to put the cart before the horse, and would at once place the physical medicine specialist in a position of inferiority in relation to his colleagues. His department would become a reference department in which he would be regarded simply as the overseer of a number of auxiliary technicians.

In this regard, it seems to me deplorable, after the endeavours that have been made to emancipate our subject and to place it on equal terms with others, that the supervision of physiotherapists should be regarded as one of the primary ambitions of the specialty. If, on the other hand, the physical medicine specialist is regarded as the clinical peer of representatives of other specialties, he will receive and refer out-patients from within and without the hospital, and gain the acquisition of beds when these are available. He will also achieve undisputed control of those cases which have become recognized as his primary province and which form the bulk of his out-patient clinics and his private practice. These include cases of chronic rheumatism and arthritis, certain oedemas and peripheral vascular disorders, patients complaining of symptoms such as pain, weakness, or stiffness, which are referred by the general practitioner for diagnosis as well as for treatment. Surely this is a primary field, wide enough and responsible enough to take an honoured place in any hospital service.

The Welding of Rheumatism and Rehabilitation

Let me return to the origin of physical medicine, which sprang from two Sections of the Royal Society of Medicine and from which we inherited the clinical conduct of rheumatism and allied disorders on the one hand, and what has come to be known as rehabilitation on the other. All our efforts before the war were directed towards the happy welding of these two objectives into one strong discipline. It was recognized in the beginning that neither rheumatism nor rehabilitation has sufficient scope or appeal in itself to form a powerful specialty. Combined they should be strong enough to do so.

During the war the emphasis was of necessity placed on rehabilitation, and the success achieved by physical medicine in its various wartime activities obscured in its own eyes the wider concept of the subject as it had

originally been conceived. It thus to some extent abrogated much of the clinical aspects of its work. This opportunity was eagerly grasped by other groups who perceived the opportunities of rheumatism, but, in my opinion, their view of the subject was too limited. In this way physical medicine lost many of its more important members. In the result, a sad cleavage has resulted in recent years which has had a most unfortunate and deleterious effect. Is it too late to recapture the spirit of physical medicine as it was originally intended? After all, other countries have been faced with the same problem and solved it satisfactorily. Switzerland, for instance, has accepted the position, and the specialty there has been called "Physical Medicine and Rheumatism". Cannot a *rapprochement* be forged, so that all viewpoints may be combined in the common interest? And cannot the future training of prospective aspirants be arrived at by friendly agreement to satisfy all concerned? This would entail certain sacrifices on both sides, but I am certain it would be for the common weal.

Special Aspects

I have spoken, according to my brief, on the clinical aspect, which I regard as the corner-stone of our subject.

In the field of rehabilitation, I am sure Dr. O'Malley, who played such an important and distinguished part at Loughborough during the war, would agree that the physical medicine specialist is called upon to have a considerable clinical knowledge of a greater number of different diseases and conditions than is demanded by any other specialty. I think that opportunities should be made for registrars during their hospital appointments to spend a period at such centres as Garston Manor, where they would study the methods in which physical medicine has shown the way, such as the importance of graduated activity as against passivity. They would acquire there the value of the welfare, social, and human aspects so essential in the attainment of maximum functional capacity, which is implicit in the philosophy of physical medicine. Arrangements should also be made for them to study the techniques used in the specialized reinstatement of patients suffering from specific diseases, in particular certain types of neurological disease. One of my greatest personal regrets is that I did not have, or did not take, the opportunity of studying, as I should have done, the methods in use for the rehabilitation of these and other types of case.

Similarly, if an apprentice in physical medicine shows definite aptitude in any branch of applied anatomy, physiology, or physics, facilities should be made for him, perhaps by a system of interchange, to study under a recognized teacher in the particular subject in which he shows such a proclivity. There is, indeed, a great need for research into these subjects, and original papers of merit would do much to enhance the prestige of the subject as a whole.

C. J. S. O'Malley

Conclusion

The training for physical medicine and the status which the specialty seeks must be clearly defined. If the Council decides that its ambitions are satisfied by the conduct of rehabilitation and by technical instruction in this field, then I can find little to suggest to improve the present position. But if, on the other hand, the Association agrees that the prestige and future of physical medicine depend first and foremost on a sound clinical basis, then the Council must take steps accordingly.

III—C. J. S. O'MALLEY

In the problem of therapeutics as applied to the whole, living social man, rehabilitation is the process which, in the words of the late Harold Balme, enables a disabled person to "lead an independent existence in a normal community—not a dependent existence in an abnormal community". I regard rehabilitation as one of the four essentials of medical practice, the other three being prevention, diagnosis, and definitive treatment.

Arising out of the recommendations of the Tomlinson Report (published in 1943) the Ministry of Labour was empowered to set up an organization to facilitate the employment of disabled persons under the Disabled Persons Employment Act of 1946. This resulted in the establishment of 14 Industrial Rehabilitation Centres.

The Aims of Rehabilitation

If I were asked where medical rehabilitation finished and industrial rehabilitation began I would answer that they are one and the same continuous process. The aims of rehabilitation as defined by the Industrial Rehabilitation Committee of the Ministry of Labour are as follows:

1. *The restoration and maintenance of function*—both physical and psychological—by means of work, remedial exercises, and other activities carried out under the supervision of a team of specialists.
2. The assessment of the patient's *capacities*, both actual and potential, making use of medical and psychological examination and trials in the unit's workshops and gardens.
3. The assessment, by the same means, of the patient's *inclinations*, including his attitude to work, to his disability, and to other people.
4. The resolution, often in collaboration with other agencies, of any *personal problems*, including marital troubles, housing, clothing, pension, compensation, and artificial aids.
5. The giving of advice about the *choice of suitable employment or training* in each individual case, and the communication of this advice to the applicant's local office.

The Role of the Physical Medicine Specialist

It will be seen that under the first aim—restoration and maintenance of function—it is specifically recommended that remedial exercises and work therapy should be carried out under the supervision of a team of specialists. Who better to supervise this work than the specialist in physical medicine? However, is the training at present available to the physical medicine specialist sufficient to enable him to carry out the whole of rehabilitation as defined above? Has the physical medicine specialist an adequate training in the assessment of physical and psychological capacity? Has he the ability to assess the patient's inclinations, his attitude towards his work, towards his disability, and towards his associates? What does he know about the agencies which help him to solve many of the personal problems which militate against successful medical rehabilitation? What training has he to enable him to give advice on resettlement and training? Is he fully aware of recent social legislation and the agencies through which this legislation can be implemented?

I would here quote Dr. J. H. F. Brotherston of the London School of Hygiene, who stated at a recent meeting of the British Sociological Association: "The medical student emerges with a well-developed scientific approach to disease processes, but is often as ignorant as the next man when it comes to understanding his patient as a person whose social situation is important in determining his reaction to ill-health. Medical training in hospitals is becoming increasingly detached from the world outside."

"Somato-psychic" Medicine

Rehabilitation is a problem of people and not of cases. We know something of why people become diseased, but we know little of why they become well. Recently great emphasis has been placed on the problems of psychosomatic medicine, the diseases of stress and of living in the modern "civilized" world. But have we studied the problems of somato-psychic medicine, which include the effect of disease and injury upon the mind, the reaction of the sick and injured to their disability?

It would be uneconomical, and in my experience not always rewarding, to send to the psychiatrist every patient who reacts badly to his disability, for we are not dealing with abnormal people but with normal people subjected to abnormal strain. I should like to commend to every specialist in physical medicine the recent book *The Neuroses*, by W. D. Alvarez, Professor of Medicine at the University of Minnesota and the Mayo Clinic. This book ably states the problem from the point of view of good doctoring. Dr. Alvarez's analysis of the patient's reaction to injury and disease is dynamic. He discusses how much the disease picture is due to heredity, to environment, to organic disease, and how much a problem of function. This book contains a fund of experience and knowledge; it covers all the problems seen in a medical rehabilitation centre.

Requirements for the Diploma

Part I of the regulations of the Diploma in Physical Medicine granted by the Examining Board in England of the Royal College of Physicians and the Royal College of Surgeons requires the candidate to be examined in anatomy, physiology, and physics in their application to physical medicine; and Part II, in the clinical, pathological, and therapeutic aspects of physical medicine. Before examination the candidate must produce evidence (*a*) of having held in recognized general hospitals at least two resident appointments extending over not less than twelve months; and (*b*) of having completed two academic years (21 months) of full-time study, consisting of: (i) adequate instruction, theoretical and practical, in applied anatomy, applied physiology, and applied physics in a recognized medical school or institution, and (ii) instruction, theoretical and practical, in the physical medicine department of a recognized general hospital or institution, in the clinical, pathological, and therapeutic aspects of physical medicine. Anatomy, physiology, and physics, the basic sciences of physical medicine, are stressed, but a candidate is not specifically required to have had any experience in elementary psychology or elementary sociology. Rehabilitation is an example of a medico-social problem.

The Chartered Society of Physiotherapy requires a candidate for its examination to have had training in elementary psychology. Surely if the physiotherapists with whom we work must have this knowledge, how much more important is it for the specialist also to be trained in these problems!

In my opinion, resident appointments should be held in (1) general medicine; (2) general surgery; and (3) orthopaedics; and also (4) in a neuroses clinic. Therefore I suggest that under subparagraph (i) of paragraph (*b*) of the regulations for the Diploma, clinical psychology should be added. In addition, as I consider that rehabilitation is the therapeutic part of social medicine, the candidate for the Diploma should have had a course of lectures in social medicine at a recognized school in this subject. Even successful candidates for the Fellowship of the Royal College of Surgeons and for the Membership of the Royal College of Physicians usually have had little or no training in the problems of social medicine, and it has been my experience that many consultants, and even professors of medicine, have no knowledge of recent social legislation.

The Importance of Motion Studies

I have so far emphasized the functional and social aspects of rehabilitation. I would like now to draw your attention to the physiological and kinesiological aspects of motion studies, to which modern schools of anatomy attach increasing importance. Have we as physical medicine specialists a knowledge of the facilitating and inhibitory factors of motion? Do we realize that conscious influences sometimes inhibit and unconscious influences facilitate? The integration of the various factors in the mechan-

ism of co-ordination of movement is extremely important. The formation of good habits of movement is our prime aim in rehabilitation. If it is important to train the athlete in order to obtain maximum efficiency of function, how much more important is it to train the disabled! It is relatively easy to draw up a programme for the rehabilitation of a disabled person, but it is much more difficult to get that programme carried out efficiently, consistently, and above all willingly. Therefore the physical medicine specialist of the future should spend some time in a well-organized and enlightened rehabilitation centre.

Summary and Conclusions

The Tomlinson Committee reported in 1943; now ten years later a new committee under the chairmanship of Lord Piercy has been set up to study the problems of the disabled. Its terms of reference are: To review in all aspects the existing provisions for the rehabilitation, training, and resettlement of disabled persons, full regard being had to the need for the utmost economy in the Government financial contribution, and to make recommendations.

I believe that physical medicine has a great future in the field of rehabilitation. I also believe that physical medicine specialists have not been trained in the past either to supervise or to direct their patients along the path of full functional recovery. I have suggested that there are certain gaps in our training, and have made some tentative suggestions as to how we can bridge these gaps.

Rehabilitation and its successful outcome are a challenge that must be taken up by physical medicine specialists. More and more is it the problem of the Welfare State. If physical medicine does not take up this challenge, then no doubt other disciplines will.

The country in general, and Parliament in particular, are extremely interested in this problem. If physical medicine specialists fail now they will have lost a golden opportunity. As they say in Finland, "Who should lift the cat's tail but the cat himself?"

CLINICAL REPORTS

A CASE OF PSORIASIS ARTHROPATHICA*

IT has been known for more than a hundred years that psoriasis and arthritis often occur together in the same patient. In 1860 Bazin made the distinction between psoriasis with joint lesions, which he called psoriasis arthritica, and psoriasis without joint lesions, which he termed psoriasis herpetica. It is unlikely that the occurrence of the two diseases in the same patient is fortuitous, but their exact relationship remains a mystery. In most cases of psoriasis arthritica, even when the terminal interphalangeal joints are involved, the joint disease is said to be indistinguishable on clinical, radiological, and pathological grounds from rheumatoid arthritis (Dawson and Tyson, 1938; Bauer, Bennett, and Zeller, 1941). In a few patients the terminal interphalangeal joints alone are affected (Bauer *et al.*, 1941; Sterne and Schneider, 1953), and Bauer has suggested that the title "psoriasis arthropathica" be restricted to this rare group of cases. A case of this condition seen recently is described below.

Case History

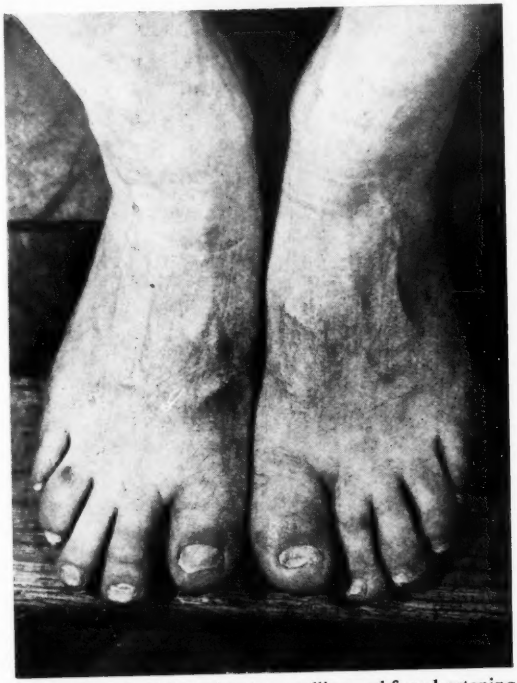
A male aged 41, a watchmaker, was referred to University College Hospital in January, 1953, for treatment of arthritis confined to the terminal joints of his fingers and toes. Psoriasis first appeared in 1932, when the patient was 21, but the nails were not affected until 1951. In 1939, following minor trauma, the right big toe became tender and swollen and walking was painful. Aching and stiffness have persisted since, with acute attacks of pain several times a year, precipitated by trauma but never coming on at rest or in bed at night. In 1949, while squeezing the interphalangeal joint of the right hallux, he noticed what he describes as "pus" spurt out from under the nail fold, and he has since found that he can often express "pus" in this way, especially after a hot bath. The toenails were not affected by psoriasis until 1951.

The terminal interphalangeal joints of the first, second, and fourth digits of the left hand became swollen and tender eighteen months ago, and the interphalangeal joint of the left hallux was affected a year ago. More recently all the terminal interphalangeal joints in the feet have become stiff and painful.

Examination.—On examination he was seen to be a well-built, healthy-looking man, with scattered patches of dry psoriasis mainly over the back of the trunk, extensor surface of the elbows, and symmetrically over the front of the thighs; there was psoriasis of all the nails. The hands were warm and moist, with slight swelling of the affected terminal interphalangeal joints. The feet were also warm and moist, the skin on the dorsum of the toes being erythe-

* Case shown at the Clinical Meeting of the Annual Meeting of the British Association of Physical Medicine on April 17, 1953.

PLATE I



A, Photograph of feet, showing swelling and foreshortening of the big toes and psoriasis of the nails.

B, Radiograph of right hallux, showing destruction of proximal phalanx and interphalangeal joint and normal appearance of metatarso-phalangeal joint.

[S.M. face p. 265

matous and the distal skin creases prominent. The interphalangeal joints of both big toes were swollen and tender, with some foreshortening, especially in the right (Plate I, A). Passive movement of this toe revealed excessive mobility at the terminal joint, although active flexion of the right hallux was not possible. No other joints were affected and no other abnormal physical signs elicited.

The erythrocyte sedimentation rate, leucocyte count, and blood cholesterol and plasma uric acid levels were within normal limits; the Wassermann and Kahn reactions were negative. *Staphylococcus albus* was cultured from pus expressed from the nail fold of the right hallux.

Radiographs showed a number of small erosions at the base of the distal phalanges in the left hand and both feet, and gross destruction of the interphalangeal joint and proximal phalanx of the right hallux, with extra-articular erosions but without osteoporosis (Plate I, B).

Discussion

This type of arthritis associated with psoriasis is usually restricted to the terminal interphalangeal joints, but may rarely involve the other small joints of the hands and feet (Fawcitt, 1950; Nunemaker and Hartman, 1950; Sterne and Schneider, 1953). Clarke (1950) has described one case in which there was gross destruction of bone with the development of the *main en lorgnette* deformity.

Bauer, Bennett, and Zeller (1941) have reported the only post-mortem study of this condition—in a man of 68 who died from a coronary thrombosis; he had suffered from arthritis of his terminal interphalangeal joints for 44 years, and psoriasis for only 29 years. Bone destruction and resorption were marked except at the base of the distal phalanges, where marginal overgrowth of bone at the site of tendon insertions resulted in the characteristic cup-like deformity. Diffuse atrophy typical of rheumatoid arthritis was absent, the terminal joint spaces being replaced by dense fibrous tissue.

Radiographs, too, do not show the rarefaction of bone one would expect in a long-standing rheumatoid arthritis. The excessive destruction of bone and joint, with pointing of the proximal phalanx and cup-like expansion of the distal phalanx, is characteristic of psoriasis arthropathica, but must be distinguished from certain other conditions. Apart from gout, trophic changes in the terminal phalanges and interphalangeal joints, especially those due to leprosy, yaws, syringomyelia, diabetes, syphilis, and scleroderma, may be difficult to distinguish from radiological appearances alone (Brailsford, 1948; Fawcitt, 1950).

It has been suggested by Sterne and Schneider (1953) that the arthritis may be secondary to chronic infection adjacent to the joint or to associated vascular changes. There is evidence in this patient of a low-grade infection with *Staphylococcus albus* in the tissues adjacent to the interphalangeal joint of the right hallux.

REFERENCES

BAUER, W., BENNETT, G. A., and ZELLER, J. W. (1941) *Trans. Ass. Amer. Phys.*, **56**, 349.
BRAILSFORD, J. F. (1948) *Radiology of Bones and Joints*, 4th ed., p. 668. London, Churchill.
CLARKE, O. (1950) *Lancet*, **1**, 249.
DAWSON, M. H., and TYSON, T. L. (1938) *Trans. Ass. Amer. Phys.*, **53**, 303.
FAWCITT, J. (1950) *Brit. J. Radiol.*, **23**, 440.
NUNEMAKER, J. C., and HARTMAN, S. A. (1950) *Ann. intern. Med.*, **33**, 1016.
STERNE, E. H., and SCHNEIDER, B. (1953) Ibid., **38**, 512.

S. MATTINGLY

University College Hospital,
London.

A CASE OF SHOULDER–HAND SYNDROME*

THE following case of post-hemiplegic shoulder–hand syndrome is reported because the patient's condition has been followed through to the stage where symptoms and signs have disappeared and recalcification is apparent in the radiographs.

Case Report

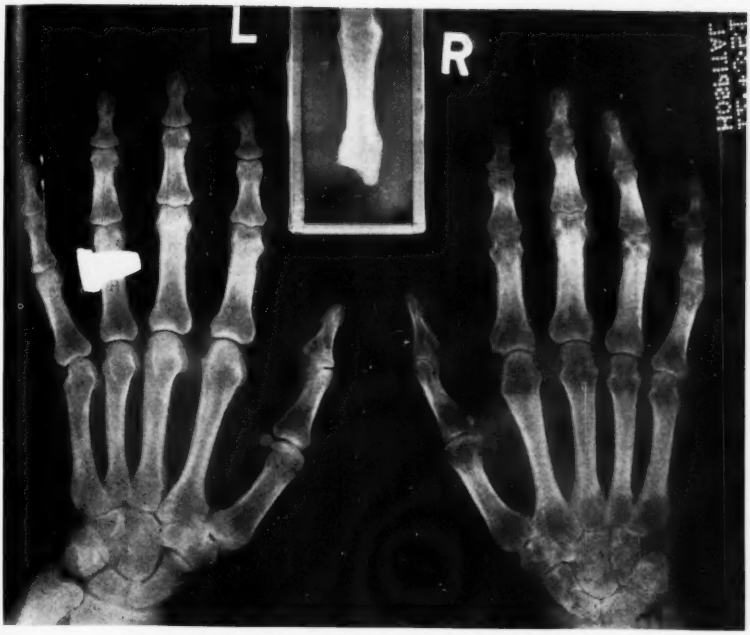
A male hairdresser, aged 57 years, attended the Department of Physical Medicine and Rheumatism at the Middlesex Hospital in November, 1950, complaining of pain in the right shoulder of one month's duration. The onset was sudden and related by him to an injury to the shoulder when he was alighting from a bus. On full clinical examination no abnormality was found, except restriction of abduction and rotation of the right shoulder. Physiotherapy in the form of heat and exercises to the shoulder was prescribed.

In the following month the patient had a mild right-sided hemiplegia. Two months after this he again attended the department. He then complained of a burning pain in the shoulder, and joint movement was more restricted than it had been before. In March—that is to say, three months after the hemiplegia—pain in the shoulder was less. The patient complained of swelling and a burning sensation in the right hand with paraesthesiae extending from the wrist to all the fingers. Shoulder movement was still much restricted. The hand was hot and tender, and movements of the fingers increased his symptoms. Interphalangeal contracture of the fingers was noted. Movement at the elbow was normal. Radiographs at this stage (Plate II, A) seemed to confirm the provisional diagnosis of shoulder–hand syndrome. The following treatment was prescribed: wax baths followed by massage and movements to the hands, and radiant heat and movements to the shoulder.

Progress.—The shoulder pain disappeared first, some four months after the onset, although the range of movement did not increase at once. The swelling of the hand subsided more slowly and pain gradually became less. X-ray examination after six weeks showed no radiological change.

* Based on a paper read at the Annual Meeting of the British Association of Physical Medicine on April 18, 1953.

PLATE II



A, Radiograph to show osteoporosis in the right hand.

B, Radiograph showing commencing recalcification in the right hand.

A, Photograph showing clubbing of fingers of right hand.

B, Radiograph to show osteoporosis in the right shoulder.

Six months after the occurrence of the cerebral vascular lesion, shoulder movement had greatly increased and the hand was normal, apart from minimal interphalangeal-joint restriction and a generalized aching pain. Three months later the affected shoulder showed further improvement; the erythrocyte sedimentation rate was 40 mm. in one hour (Wintrobe), and the haemoglobin 106% (Haldane). Repeated E.S.R. and haemoglobin estimations showed that these levels were maintained.

Thirteen months from the onset of his hemiplegia he was back at work as a tobacconist. The shoulder and hand showed no clinical abnormality.

When he was next seen, in December, 1952, no abnormal symptoms were complained of and the shoulder was painless and showed a full range of movement. On clinical examination there was no abnormality apart from a hypertension and increased reflexes consistent with an old right-sided hemiplegia. Further radiographs of the hands (Plate II, B) showed osteoporosis to be less marked than on the first radiological examination. Unilateral clubbing, which had not been found at previous examinations, was, however, noted in the fingers of the right hand (Plate III, A). There was no clubbing of the toes. Radiographs of the chest revealed no abnormality. X-ray examination of the shoulders and elbows showed the presence of osteoporosis on the right (Plate III, B). The patient admitted that he could clearly remember having had pain in the elbow, which was present when his hand was causing discomfort, though he had not mentioned this at the time; no restriction of movement was, however, recorded in his notes. An electrocardiogram was normal in all respects. A Wassermann test and a gonococcal complement-fixation test gave negative reactions.

Commentary

The hand signs suggestive of shoulder–hand syndrome appeared some three months after the cerebral lesion. The pain in the shoulder was the first symptom to subside; within thirteen months of the onset the whole syndrome had cleared up. Mild elbow symptoms and radiological evidence of osteoporosis were present. These have also been described in two cases of shoulder–hand syndrome following hemiplegia reported by Steinbrocker, Spitzer, and Friedman (1948).

Clubbing of the fingers is an interesting and unexplained feature, and in the literature reviewed no cases with this finding have been described. In the present case recalcification appears to have started some twelve months after the patient became free from symptoms; no indication has been found in the literature as to when recalcification was noted by other observers.

The differential diagnosis, according to Steinbrocker (1947a, b), includes scleroderma, bursitis, periarthritis, infective arthritis, scalenus anticus syndrome, and post-infarction sclerodactylia. The latter condition, described by Askey (1941) and Johnson (1943), is similar to the shoulder–hand syndrome, but usually affects both hands in addition to one or both shoulders. In the case here described, in spite of the raised erythrocyte

sedimentation rate, rheumatoid arthritis can be excluded. The patient's symptoms remained solely in the right hand; the osteoporosis was generalized, there were no signs of articular damage and no evidence of systemic disease. Steinbrocker found an unexplained raised E.S.R. in two of his forty-one cases.

It is considered that the disability from the hemiplegia was not sufficiently marked to cause the radiological changes illustrated: the hand would have shown abnormal clinical features at the patient's first attendance following the cerebral lesion.

Sudeck's atrophy of the upper extremity constitutes a variety of the shoulder–hand syndrome, although osteoporosis is said to be more insidious in the latter condition.

Summary

1. A man of 57, with a previous history of pain in the shoulder, developed a right shoulder–hand syndrome after a right hemiplegia.

2. Thirteen months after the onset the clinical condition had cleared up completely.

3. Twelve months after the disappearance of symptoms recalcification of the bones was evident in the radiographs of the hand.

4. An unusual feature was the late development of clubbing of the fingers of the affected side.

Acknowledgments

I should like to record my thanks to Dr. F. D. Howitt for permission to investigate and report this case, which was under his care at the Middlesex Hospital, and to my colleagues in the Department of Physical Medicine and Rheumatism at the Hospital for their assistance. My thanks are also due to the X-ray Diagnostic Department and the Photographic Department for their valuable help.

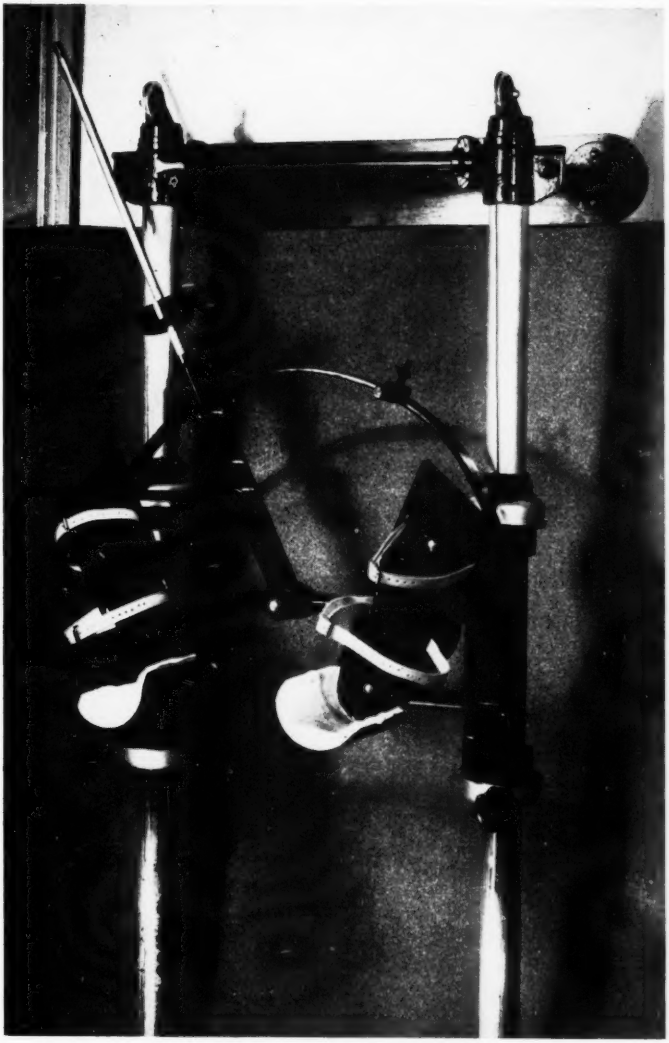
REFERENCES

ASKEY, J. M. (1941) *Amer. Heart J.*, **22**, 1.
JOHNSON, A. C. (1943) *Ann. intern. Med.*, **19**, 433.
STEINBROCKER, O. (1947a) *Ann. rheum. Dis.*, **6**, 80.
——— (1947b) *Amer. J. Med.*, **3**, 4.
——— SPITZER, N., and FRIEDMAN, H. H. (1948) *Ann. intern. Med.*, **29**, 1.

D. L. WOOLF

Middlesex Hospital,
London.

PLATE IV



The rotation exerciser fixed to the wall.

N.S.C. face p. 268]

PLATE V

The roller towel in use.

[*K.A.S. face p. 269*

NEW APPLIANCES

A ROTATION EXERCISER

THE machine illustrated in Plate IV was developed originally for the treatment of osteoarthritis of the hip-joint. It consists of two pivoted foot-pieces linked together to a central lever on which is a sliding weight, and the mechanism can be adjusted for height. It is operated by the patient, lying down on a couch or bed.

Internal rotation is simultaneous in both hips, thus preventing tilting of the pelvis. The range of internal and external rotation can be varied by means of two sliding stops on the quadrant. Active movement is followed by passive movement, and the degree of resistance to active movement is governed by the height of the weight on the central lever, which works on the metronome principle.

The machine is available as a wall fixture, or as a portable model which can be wheeled round the wards and used over a bed. It was made by the X-Ray Equipment Co., Merthyr Works, Merthyr Terrace, Barnes, London, S.W.13.

The construction of this machine was made possible by a grant from the Weir Research Fund of the Wandsworth Hospital Group.

N. S. CRAIG
Physician in Charge of Physical Medicine,
Wandsworth Hospital Group.

ROLLER TOWEL ADAPTED FOR THE HEMIPLEGIC

THE simple adaptation illustrated in Plate V enables the hemiplegic or the one-armed patient to dry himself quickly and efficiently after his bath. It was designed by Miss G. MacCaul, M.A.O.T., and was made in the Occupational Therapy Department at King's College Hospital, London.

The apparatus is easily constructed, as follows, from materials costing only a few shillings. A roller towel is hung over a wooden rod, each end of which is attached to a 5-lb. Terry spring by a D-ring and clip such as is used in dog leads, thus enabling the patient to change the towel easily. The springs are fastened in a convenient position on the wall or door of the bathroom by two screw eyes.

K. A. SOWDEN
Department of Physical Medicine, King's College Hospital.

ABSTRACTS OF THE LITERATURE

Para-articular Calcification and Ossification following Acute Anterior Poliomyelitis in an Adult. J. A. FREIBERG. *J. Bone Jt Surg.*, 1952, **34A**, 339.

The author reports a case of acute poliomyelitis complicated by para-articular calcification and ossification involving the metacarpo-phalangeal, shoulder, and hip joints. This appears to be the first report of such complication in the upper limb, these lesions usually being confined to the hip-joint and knee. The aetiology is unknown, though it appears that a systemic disturbance of calcium metabolism is present.

The patient was treated with hot moist packs and passive joint exercise, but the author does not believe that this therapy contributed to the process. Furthermore, it is his opinion that this form of para-articular calcification with subsequent ossification, though infrequent, is not so rare as it appears. Indeed, the majority of severe neurogenic lesions, whether they be acute anterior poliomyelitis or other spinal-cord diseases or injuries, may be followed by the complications referred to in this article.

O. F. VON WERSSOWETZ

The Need for Adequate Care in Complete Rehabilitation of the Disabled. A. P. AITKEN. *Surg. Gynec. Obstet.*, 1952, **95**, 317.

The total number of industrial accidents in 1950 in the United States of America was 1,952,000. Of these, 84,900 resulted in permanent disability. The author estimates that there are possibly 2,000,000 people in that country in need of rehabilitation, but that there is a sad lack of training of medical students in the subject. He regards it as important that in the early stages of disability minimum splinting should be employed so that uninvolved muscles and joints may be brought into active use as soon as possible. The need for general exercises is stressed.

According to the author, the doctor does not realize his full responsibility to the patient, which involves seeing him restored to as near normal as possible and his return to productive employment. The doctor must take into account not only the physical disability but the psychological difficulties of the patient, the financial aspects, family care and employment problems. In 1951, 4,430 persons injured on the job while covered by workmen's compensation returned to work under the Federal State programme of vocational rehabilitation, but the average time lag between injury and referral for rehabilitation was seven years. The need for immediate operation of the rehabilitation programme is suggested.

C. B. WYNN-PARRY

Rehabilitation of the Cardiac. A. JEZER. *Amer. J. phys. Med.*, 1952, **31**, 139.

The Altro Workshop of New York has been in continuous operation longer than any other vocational rehabilitation centre in America. In 1948, for the first time, it admitted convalescents from diseases other than pulmonary tuberculosis. Thirty hypertensive patients and twelve with rheumatic heart disease, aged between 18 and 55, and referred because they were considered unable to work,

were given two hours' work at their own pace in the morning and afternoon. Their clinical progress was closely watched and financial assistance was given when necessary.

It was found that in many patients the work capacity was related to the degree of anxiety more than to the organic component, especially in those with the anginal syndrome. "As the cardiac becomes accustomed to the fact that he can accomplish a small amount of work without producing damage to the heart, the anxiety factor becomes less important and the expenditure of heart muscle work is thereby reduced. This leads to an improved heart muscle efficiency and a lesser requirement of coronary flow for the same amount of work. After a longer period of work rehabilitation, less oxygen and less cardiac output are then required and less blood flows to the active muscle, despite the increased amount of work being done efficiently."

The author concludes that hypertensives who show no signs of failure should continue to work at their regular jobs, but that most other cardiac patients, especially those with fibrillation or the elderly, will require sheltered employment.

SIDNEY LICHT

Fitting the Wrist Disarticulation Case. A. B. WILSON and R. J. PURSLEY. *Orthop. prosth. Appliance J.*, 1952, **6**, 17.

There is no doubt about the difficulty of providing a comfortable, stable socket for the bulbous stump of the wrist disarticulation. When an adequate socket is provided, the over-all length of the prosthesis is excessive if standard disconnect units and terminal devices are used. To take advantage of the increased functions—greater leverage and more pronation-supination—afforded by the longer stump, the Artificial Limbs Project at the University of California, Los Angeles, and the U.S. Army Prosthetic Research Laboratory have developed a successful technique in fitting this type of case.

In fitting a below-the-elbow stump with a prosthesis two factors must be considered—stability and mobility. Maximum stability is provided by a socket fitting snugly along the entire length of the stump; but, for practical purposes, this causes the loss of all supination and pronation of the forearm. When tests were conducted to determine if a more functional prosthesis could be provided which would permit some rotation at the expense of stability, it was found that with the same tightness of fit the rotation was restricted in direct proportion to the length of the socket. Stability increased sharply as length was increased to about one-half the stump length; thereafter it increased much more slowly. Therefore the optimum length of a long below-the-elbow socket is between one-half and two-thirds of the stump length.

For the wrist disarticulation amputee it is generally recommended that the proximal end of the socket be trimmed at an angle so that the portion covering the ulna extends farther up the arm than that covering the radius. Such a socket provides greater stability in the direction in which it is most required, at no expense to rotation. Experiments have shown that a one-piece plastic socket can be made for these cases. This differs from other below-the-elbow prostheses in that it has to be channelled on each side to admit the insertion of the radial and ulnar bony prominences.

Minimum over-all length of the prosthesis can be achieved by laminating the terminal device direct to the outer plastic socket, thereby eliminating the space required by the stud-type disconnects commonly used. In a typical harnessing, flexible leather elbow hinges and an open upper-arm cuff are used with a figure-of-eight harness.

O. F. VON WERSSOWETZ

The Pain Threshold for Microwave and Infra-red Radiation. H. COOK. *J. Physiol.*, 1952, **118**, 1.

In this paper from the Department of Physics Applied to Medicine of the Middlesex Hospital, London, is described a method of evoking thermal pain (i.e. a burning pain sensation) by a microwave (10 cm.) emitter.

The normal responses to this exposure showed that the skin temperature at which pain is felt is independent of the area exposed, radiation intensity, exposure time, or anatomical site. In contrast, pain threshold or radiation intensity is dependent upon many factors. Thermal pain appears to result when a critical skin temperature is reached and not from a critical rise in temperature.

The author gives a mathematical equation for skin temperatures resulting from radiation for conditions of linear heat flow (i.e. during short exposures avoiding the effects of vasodilatation) and heat conduction perpendicular to the skin. He correlates the results of microwave exposure with thermal theory and extends this theory to infra-red pain stimuli. Consideration of the tolerated intensities of three types of thermogenic radiation leads to the general conclusion that energy absorption in the first 1 or 2 mm. of superficial tissues is the same for all radiations. Further, thermal pain is dependent upon end-organ temperature.

Spatial summation of pain and warmth sensation is briefly discussed.

A. T. RICHARDSON

BOOK REVIEW

Through Movement to Life. By JOHN ARTHUR. London: Chapman and Hall, Ltd. Pp. 93. 7s. 6d.

From 1946 to 1949 the author ran a furniture factory as a sheltered workshop for the disabled. He describes in his book the many problems and difficulties encountered in this pioneer effort. In the first part there are chapters on the selection of suitable work, on the attitude of trade unions to disabled workers, and, most important, on factors concerned with the economic employment of the disabled. Part II deals with the management of specific disabilities, such as rheumatism, deafness, amputation, and epilepsy. The brief clinical accounts of the various diseases contain statements which are open to criticism; these do not, however, detract from the value of a very readable book which describes an important aspect of rehabilitation.

D. A. KININMONTH

BRITISH ASSOCIATION OF PHYSICAL MEDICINE

ANNUAL BUSINESS MEETING

THE business meeting of the Annual General Meeting was held on Saturday morning, April 18, 1953.

The minutes of the 1952 Annual General Meeting were read and approved. The report of the Council for 1952–3 was received without comment, and the balance sheet was presented by the Honorary Treasurer and also approved.

Officers elected for 1953–4 were as follows:

President: The Right Hon. Lord HORDER, G.C.V.O.
Vice-President: DR. W. S. TEGNER
Honorary Secretary: DR. A. C. BOYLE
Honorary Treasurer: DR. P. BAUWENS
Honorary Editor: DR. H. A. BURT

The following were elected Members of Council: DR. W. F. DUNHAM, DR. H. F. TURNEY, DR. R. W. WINDLE, and DR. D. C. ARNOTT (the last to fill the casual vacancy created by Dr. Martin's death).

The Honorary Editor, in presenting his report, referred to the encouraging increase in circulation of the ANNALS OF PHYSICAL MEDICINE, and to the favourable reviews in the medical press. Despite this, the Editorial Board felt some concern about the limited supply of first-class papers submitted for publication. Dr. Burt made a plea for members to devote more time to experimental work and clinical research: he made the point that to an increasing extent a young man's work was judged by his publications. He concluded by expressing his personal thanks and those of the Editorial Board to Mr. H. C. Papadopulo for his sub-editorial help. The meeting approved the recommendation of Council that the Editorial Board should in future be regarded as an executive committee and as such should be re-elected annually. Drs. Arnott and Boyle were elected additional members of the Board.

The meeting endorsed the recommendation of Council that the British Association of Physical Medicine should confirm its membership of the International Federation of Physical Medicine and should pay an annual subscription of 2s. for each member of the Association.

The following addition to the rules was approved: "That a class of overseas membership should be created and that such members who should be resident outside the United Kingdom and Eire should pay an annual subscription of 30s., be entitled to attend all meetings and to receive the official journal, but have no voting powers."

Finally the meeting agreed that plans should go forward for a joint meeting with the Société Belge de Physiothérapie to be held at Ostend in June, 1954.

D. C. ARNOTT

Minimum over-all length of the prosthesis can be achieved by laminating the terminal device direct to the outer plastic socket, thereby eliminating the space required by the stud-type disconnects commonly used. In a typical harnessing, flexible leather elbow hinges and an open upper-arm cuff are used with a figure-of-eight harness.

O. F. VON WERSSOWETZ

The Pain Threshold for Microwave and Infra-red Radiation. H. COOK. *J. Physiol.*, 1952, **118**, 1.

In this paper from the Department of Physics Applied to Medicine of the Middlesex Hospital, London, is described a method of evoking thermal pain (i.e. a burning pain sensation) by a microwave (10 cm.) emitter.

The normal responses to this exposure showed that the skin temperature at which pain is felt is independent of the area exposed, radiation intensity, exposure time, or anatomical site. In contrast, pain threshold or radiation intensity is dependent upon many factors. Thermal pain appears to result when a critical skin temperature is reached and not from a critical rise in temperature.

The author gives a mathematical equation for skin temperatures resulting from radiation for conditions of linear heat flow (i.e. during short exposures avoiding the effects of vasodilatation) and heat conduction perpendicular to the skin. He correlates the results of microwave exposure with thermal theory and extends this theory to infra-red pain stimuli. Consideration of the tolerated intensities of three types of thermogenic radiation leads to the general conclusion that energy absorption in the first 1 or 2 mm. of superficial tissues is the same for all radiations. Further, thermal pain is dependent upon end-organ temperature.

Spatial summation of pain and warmth sensation is briefly discussed.

A. T. RICHARDSON

BOOK REVIEW

Through Movement to Life. By JOHN ARTHUR. London: Chapman and Hall, Ltd. Pp. 93. 7s. 6d.

From 1946 to 1949 the author ran a furniture factory as a sheltered workshop for the disabled. He describes in his book the many problems and difficulties encountered in this pioneer effort. In the first part there are chapters on the selection of suitable work, on the attitude of trade unions to disabled workers, and, most important, on factors concerned with the economic employment of the disabled. Part II deals with the management of specific disabilities, such as rheumatism, deafness, amputation, and epilepsy. The brief clinical accounts of the various diseases contain statements which are open to criticism; these do not, however, detract from the value of a very readable book which describes an important aspect of rehabilitation.

D. A. KININMONTH

BRITISH ASSOCIATION OF PHYSICAL MEDICINE

ANNUAL BUSINESS MEETING

THE business meeting of the Annual General Meeting was held on Saturday morning, April 18, 1953.

The minutes of the 1952 Annual General Meeting were read and approved. The report of the Council for 1952–3 was received without comment, and the balance sheet was presented by the Honorary Treasurer and also approved.

Officers elected for 1953–4 were as follows:

President: The Right Hon. Lord HORDER, G.C.V.O.
Vice-President: DR. W. S. TEGNER
Honorary Secretary: DR. A. C. BOYLE
Honorary Treasurer: DR. P. BAUWENS
Honorary Editor: DR. H. A. BURT

The following were elected Members of Council: DR. W. F. DUNHAM, DR. H. F. TURNEY, DR. R. W. WINDLE, and DR. D. C. ARNOTT (the last to fill the casual vacancy created by Dr. Martin's death).

The Honorary Editor, in presenting his report, referred to the encouraging increase in circulation of the ANNALS OF PHYSICAL MEDICINE, and to the favourable reviews in the medical press. Despite this, the Editorial Board felt some concern about the limited supply of first-class papers submitted for publication. Dr. Burt made a plea for members to devote more time to experimental work and clinical research: he made the point that to an increasing extent a young man's work was judged by his publications. He concluded by expressing his personal thanks and those of the Editorial Board to Mr. H. C. Papadopulo for his sub-editorial help. The meeting approved the recommendation of Council that the Editorial Board should in future be regarded as an executive committee and as such should be re-elected annually. Drs. Arnott and Boyle were elected additional members of the Board.

The meeting endorsed the recommendation of Council that the British Association of Physical Medicine should confirm its membership of the International Federation of Physical Medicine and should pay an annual subscription of 2s. for each member of the Association.

The following addition to the rules was approved: "That a class of overseas membership should be created and that such members who should be resident outside the United Kingdom and Eire should pay an annual subscription of 30s., be entitled to attend all meetings and to receive the official journal, but have no voting powers."

Finally the meeting agreed that plans should go forward for a joint meeting with the Société Belge de Physiothérapie to be held at Ostend in June, 1954.

D. C. ARNOTT

PHYSICAL TREATMENT AT THE BRITISH SPAS—AN INVESTIGATION

AT the suggestion and under the direction of the Medical Committee of the British Spas Federation (Chairman, Lord Horder; Secretary, Dr. G. D. Kersley), an investigation of the effect of physical treatment, including hydrotherapy, on rheumatic cases at a number of centres has been carried out.

It was realized from the start that a completely controlled therapeutic trial was not possible, as it was impossible to rule out psychological influences. Such factors must, however, play their part in the effect of therapy, and every effort has been made to give genuine clinical assessments. Only typical cases of rheumatoid arthritis, osteoarthritis, and fibrositis were investigated, and no parenteral therapy was used during the period of observation. Cases were assessed before treatment, directly after treatment, i.e. in 3 to 6 weeks, and again 3 months later.

One hundred and twenty-eight cases of rheumatoid arthritis, 227 of osteoarthritis, and 112 of fibrositis were followed up in this way, and the results statistically analysed by E. Lewis-Faning, D.Sc., of the Welsh National School of Medicine. Degree of pain on movement or at rest, swelling, tenderness, and range of movement were numerically recorded, together with age and sex, on a special proforma drawn up for the purpose. No points of special interest were forthcoming from analysis of age and sex groups, but the general effect of treatment, both immediate and after 3 months, is of importance and accords well with clinical impressions.

In the rheumatoid arthritis group, of 128 patients approximately half appeared to derive significant immediate benefit and a slightly larger number were definitely improved on a 3-months review. This applied both to a more "active" and to a more "quiescent" sub-group. In the former 68% showed decrease in tenderness and 54% of swelling of the worst affected joint, but only 36% had reduction of pain at rest. One patient only appeared to be worse.

In the group of 227 osteoarthritics, approximately two-thirds stated that they had less pain and half had increase in range of movement. After 3 months the result was slightly less good, with only 62% stating that they had less pain than before treatment.

In the group of 112 "fibrositis", again two-thirds claimed improvement, and the result of assessment 3 months later showed neither increase nor decrease in this benefit figure.